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PLANNING STUDY FOR RESEARCH AND DEVELOPMENT

Some Likely Key Intelligence Questions for the 1980's

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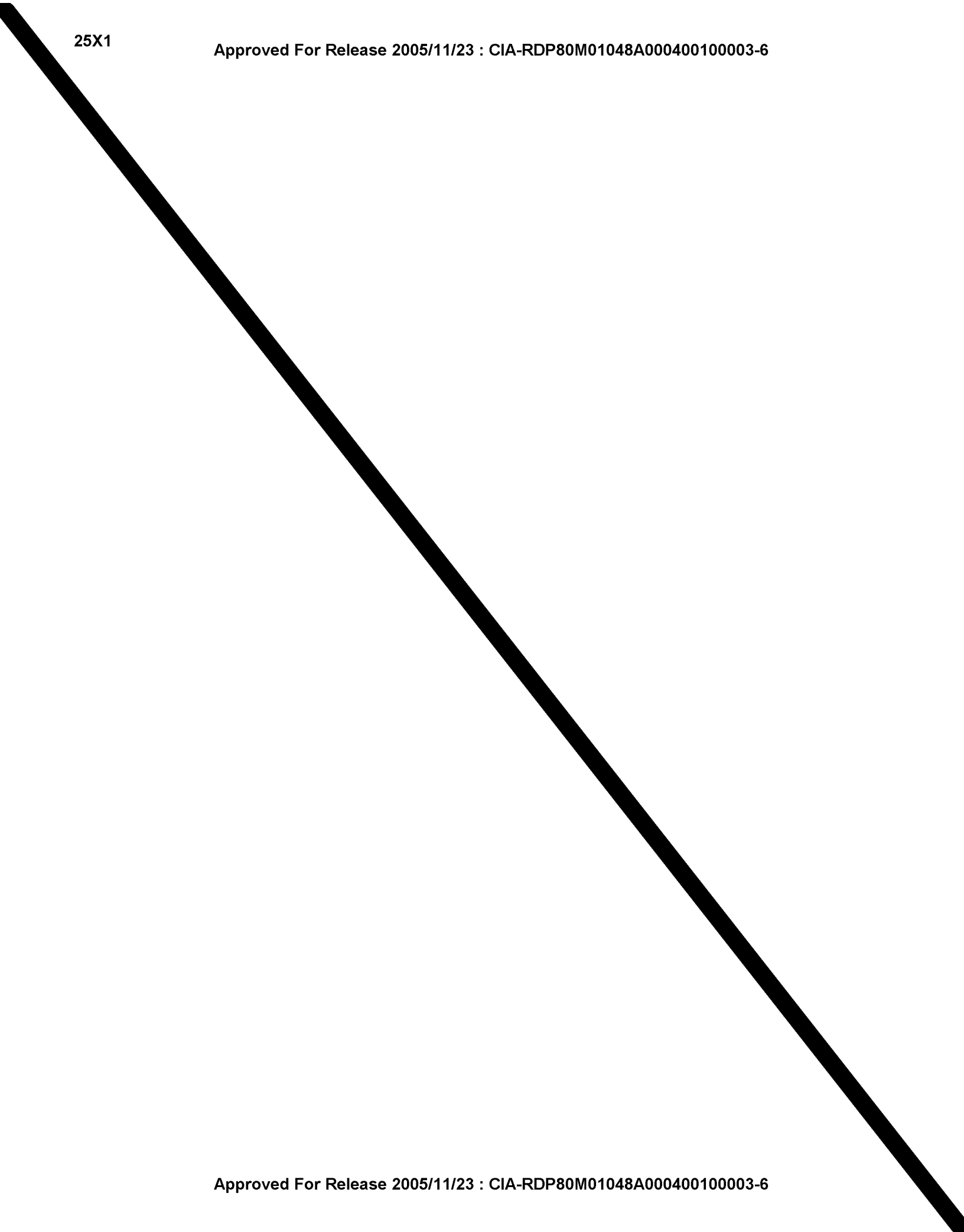

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SOME LIKELY KEY INTELLIGENCE QUESTIONS FOR THE 1980's

Planning Study for Research and Development

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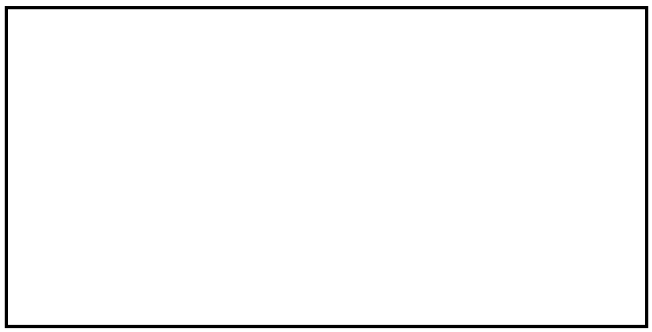

Office of Research and Development

July 1974

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And now, I said, let me show in a figure how far our nature is enlightened or unenlightened:—Behold! human beings living in an underground cave, which has a mouth open towards the light and reaching all along the cave; here they have been from their childhood, and have their legs and necks chained so that they cannot move, and can only see before them, being prevented by the chains from turning round their heads. Above and behind them a fire is blazing at a distance, and between the fire and the prisoners there is a raised way; and you will see, if you look, a low wall built along the way, like the screen which marionette players have in front of them, over which they show the puppets.

I see.

And do you see, I said, men passing along the wall carrying all sorts of vessels, and statues and figures of animals made of wood and stone and various materials, which appear over the wall? . . .

You have shown me a strange image, and they are strange prisoners.

Like ourselves, I replied; and they see only their own shadows, or the other shadows which the fire throws on the opposite wall of the cave?

True, he said; how could they see anything but the shadows if they were never allowed to move their heads?

And of the objects which are being carried in like manner they would only see the shadows?

Yes, he said.

To them, I said, the truth would be literally nothing but the shadows of the images.

PLATO, *Republic*, Book VII

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SOME LIKELY KEY INTELLIGENCE QUESTIONS FOR THE 1980's

SUMMARY

The purpose of this study is to provide a broad conceptual basis to support ORD's technical Divisions in formulating research and exploratory development programs to meet future intelligence requirements. The Summary highlights some possible threats to the national security and some relevant crucial questions.

Critical shortages of natural resources will result in world-wide economic struggle. Of greatest concern are anticipated global food shortages and great famines. In the absence of food, human migrations from submarginal to marginal lands may result.

- What countries will have drought and famine?
- What migrations, invasions, and conflicts will result?

New political alliances will emerge based on resource technology amalgamations. These alliances will spur the growth of underdeveloped, resource-rich countries while providing needed metals and minerals to industrialized nations.

- Will current inflation, exploding world monetary crisis resulting from the Arab oil embargo, and the "war of nerves" involving Israel and the Arabs, the U.S. and West Europe, China and the U.S.S.R. result in competition for resources and critical shortages?
- What will be the structure of foreign trade during the next decade?
- What is the role of intelligence in the event of severe international commercial and industrial depression?

Multinational corporations (MNC's) will become increasingly important as the volume of trade expands in the natural resource markets of the world. In order to reduce the conflicts their policies may generate between governments of developed and developing nations, the MNC's may evolve new ways of operating that will create less conflict and give them greater acceptance throughout the world.

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The violence, conflict, and social change of the 1980's may be between societies as well as within them. The most important concern for the leaders of these societies is to search out ways to prevent the occurrence of these troubles or to conquer those that occur.

- What methods can be used to assimilate all the information that the Community collects in order to advise decisionmakers of the important trends and prospects?

The decreasing intervals between discovery and application in the physical sciences are increasing the rate of technological change. Vast innovations will impact on communications, transport, and automation of industrial production. This will cause growth of technocratic controls.

- What are the prospects for future gaps in technologies that favor the U.S.S.R. or other industrial nations over the U.S.?
- How can comparisons be made at the level of industrial technology, the level of engineering development, and the future level of technology?

New weapons capabilities including some surprises are expected to emerge from Soviet and Chinese R&D programs. Revolutionary developments in missile and space offense and defense weapons will require major revisions of concepts that underlie current strategic arms agreements. Arms limitation agreements will be expanded, but membership in the nuclear weapons community will also increase.

- What countermeasures can be anticipated against U.S. submarine launched ballistic missiles (SLBM's)?
- What are the vulnerabilities of advanced global command and control systems to disruption by obstructive or destructive actions?
- What countries [redacted] are likely to produce nuclear weapons? How can these activities be monitored?

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A technological revolution is opening up the ocean beds. Exploitation of their mineral and biological resources is accelerating. The oceans will be subjected to ever increasing exclusive and competing national controls. Rival states or groups of states will divide widening portions of the ocean beds.

- What military and economic controls will be essential to constructive, international cooperation and the prevention of disastrous conflicts?
- What capabilities for underwater monitoring and search will be required to control and regulate international agreements concerning the sea beds?

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One of the principal difficulties with future intelligence questions is that their credibility rests merely on outward grounds. Errors and uncertainties are surely inherent in our judgments about the future. Nevertheless, we must attempt to project the future in order that we can identify some possible important questions. Next, we must strive to escape the bounds of tradition and make the R&D programs of today relevant to the intelligence needs of tomorrow.

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INTRODUCTION

The mission of the Office of Research and Development is oriented towards future intelligence problems. For this reason, it is essential to identify capabilities needed for the future so that the programs planned by the Office of Research and Development are relevant to the future needs of the Intelligence Community.

The approach employed in undertaking the study was to project a synoptic view of the world in the 1980's, to identify some consequent threats to the national security, and to postulate some relevant intelligence questions. The capabilities of the Intelligence Community in the 1980's were also conjectured.

There is more to be done. The ultimate objective is to identify research and development needs. This requires an assessment of the essential intelligence capability and a projection of trends in intelligence analysis methodologies, and intelligence collection technologies. Endeavors toward this objective will require active participation of all of the Divisions of the Office of Research and Development.

This study is an attempt to anticipate future intelligence questions. Its shortcomings are primarily due to failures of imagination or nerve concerning the future of the world. For this reason, it is likely that our questions are generally conservative. Some spectacular events that will result from the abstrusely interrelated streams of economic, political, scientific, and technological developments have probably not been anticipated.

While we all recognize that the future is unpredictable, we expect that this effort will provide a few new and interesting questions. Perhaps the most important question relevant to the future is one asked by Werner Heisenberg about science—"To what extent are we bound by tradition in the selection of our problems?".

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SCENARIO FOR THE 1980's

Many of the current key intelligence questions are general and can reasonably be expected to persist into the 1980's. However, their structure and priorities can be expected to undergo drastic modification. Therefore, the perennial concerns which spur today's intelligence activities do not provide sufficient guidance for developing exploratory research in anticipation of world conditions beyond 1980.

SOCIOECONOMIC TRENDS

Higher priorities have been assigned to economic intelligence. These higher priorities evidence a nascent concern over increasing economic competition between the U.S. and its allies or trading partners as well as with potential adversaries. These concerns focus on economic policies, motivations, activities, capabilities, and vulnerabilities in an era of increasing competition for scarce resources.

The projections of Forrester [1] and Meadows [2] depict world population growth for about 50 years and the continuing depletion of natural resources. The details of these projections are certainly not exact. Nevertheless, natural resources are being depleted at rates which cannot be sustained. Worsening global weather conditions are expected to accelerate increasing food shortages. Corrective actions will be needed to modify these trends in order to avoid catastrophic consequences.

[1] Forrester, Jay W. *World Dynamics*, Wright-Allen Press, Cambridge, Mass., 1971.

[2] Meadows, D. H., D. L. Meadows, J. Rander, and W. W. Behrens III. *The Limits to Growth*, Universe Books, N.Y., 1972.

Population

The number of people in Africa, Asia, Latin America, and Oceania could double by the year 2000 to some five billion people. The combined population of North America, U.S.S.R. and Europe could double to about two billion people by the year 2050. These predictions are based on the presumption that current average doubling times will be maintained.

Table I shows that the less developed areas now contain nearly four times as many countries and

TABLE I

NUMBER OF YEARS TO DOUBLE POPULATION IN MAJOR AREAS OF THE WORLD*

Areas	Number of Countries	Estimated Pop. Mid-1970 (Billions)	Number of Years To Double Population
Latin America	27	0.28	24
Africa	47	0.34	27
Asia	35	2.06	31
Oceania	2	0.02	35
Sub Total	111	2.70	
North America	2	0.23	63
U.S.S.R.	1	0.34	70
Europe	27	0.44	80
Sub Total	30	1.01	

*Table I was prepared using data from *World Facts and Trends* by John McHale, p. 37, Collier Books, N.Y., N.Y., 1972

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more than two and a half times as many people than the developed areas. The median time for the population of the less developed countries to double is currently less than a generation (30 years). For example, in one generation the population of Asia alone is projected to be four billion people which is more than all of present day humanity.

The highest population growth rates occur in those regions with the lowest per capita food production. Food production may have to double in the next generation in order to maintain present diet levels.

Climatology

A major weather change is on the way. A declining trend in the mean northern hemispheric temperature is apparent. This will increase the severity of winter temperature in northern latitudes and decrease the availability of rainfall in the horse latitudes. The result will be a decreasing trend in the world food supply. A continuation of this trend will have a destabilizing effort on most of the rich nations and many of the poor nations of the world.

Food

The availability and distribution of food will be a major source of tension by and during the 1980's. A predicted drop in the average temperature, local droughts, and a shortage of fertilizer will result in a severe world-wide food shortage. Shortages of grains and other staple farm products will induce mass migrations and conflicts over arable lands. A race for exploitation of the oceans for food could result in uncontrolled competition or forced compromises that will reduce the potential yield of this important food source during the time of most critical shortage. These situations will aggravate disagreements between rich and poor nations as the competition for scarce resources intensifies.

Energy and Minerals

Countries depending on resource imports will lose economic bargaining power to energy and mineral exporting countries. This could be accompanied by a corresponding shift in the base of military strength if international resource flows are interrupted. The vulnerabilities of these supply lines as political hostages, especially under major power sponsorship, is a viable threat. National economies will be affected in importing countries that cannot finance the costs of imported resources.

The Soviet Union and China will continue to be self-sufficient in energy assuming exploitation of potential oil and gas reserves. Through 1980, Western Europe will be at least 85 percent dependent on the Middle East and North Africa. Japan will be almost totally dependent on external energy sources. The U.S. will probably be able to supply a substantial amount of its own needs during this period, but it will continue to be vulnerable to disruption of external supplies and ill-equipped to supply Western Europe and Japan in the event of emergency.

The future picture in terms of scarce minerals is similar. The current petroleum situation has demonstrated that natural source shortages have the potential for creating massive economic dislocation. The impact of shifting wealth will become intolerable to the world financial community well in advance of 1980. It is unimaginable that the world will reach the 1980's without the creation of strong, new or revitalized international organizations to cope with the new world economic dynamics.

Multinational Corporations

Emergence of great multinational corporations (MNC) over the past two decades has introduced new elements as major forces in the economic dynamics which will operate in the 1980's. These entities provide the mechanism for managing the increasingly interdependent relationships between resource availability, technology for exploitation, and the international political environment.

The MNC's provide a means for accomplishing this increasingly important function; yet, their very success has become a source of concern. The size and economic power which these companies have achieved has created fear and jealousy, especially in the natural resource exporting countries.

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Most MNC's are aware of the foreign identity stigma in second party countries. Their present modality is to decrease their foreign profile and have local people staff and operate the company as an indigenous industry. MNC's provide capital and reap profits. They will avoid involvement in international politics since it is too risky in a business sense.

As multinational corporations are increasingly affected by international events, their home governments will be under increasing pressure to provide formal support; for example, foreign economic and industrial intelligence. These governments will need to find new ways to support their industries in order to maintain their international economic positions in the 1980's.

SOCIOPOLITICAL TRENDS

The increasing destructive power of weapons will exercise a paralyzing influence upon the emergence of large-scale conflicts especially among the large advanced nations. The United States and the Soviet Union will continue to seek a power balance, each feeling pressures to divert resources to domestic problems versus a continued awareness of the need to maintain weapons parity. Arms limitation negotiations provide a focus for this issue and a stimulus to improve and upgrade existing systems with increased emphasis on technology as a source of new weapons. Kahn* sees nothing on the horizon which is likely to change the character of the chronic political confrontations which threaten the stability of the world today. He lists:

Triangular	*Divided Nation-States*	*Confrontations*
U.S. vs. U.S.S.R.	Germany	Arab-Israeli
U.S.S.R. vs. China	China	Indian-Pakistan
China vs. U.S.	Korea	Japan-China
	Vietnam	

The Japan/China confrontation has not been given much consideration of late, but these two nations have a long history of conflict. The rising Japanese economy could be considered a threat to China's position in East Asia and a symbol of decadent values which threaten China's dedication to the hard and lean way of life.

Japan

Recent events make clear that continued access to natural resources, industrial capacity, and capital is vital to maintenance of national power. Japan, for example, has been viewed by most experts as a rising superstar nation. Energy and resource problems are now recognized as modifying this prediction. Access to oil from the China Sea or other sources with controlled costs will be needed to soften the impact of current Arab oil prices. A high degree of material recycling will be essential to avert a critical shortage in material resources. Japan's technological and industrial base must remain competitive during periods of changing costs and increasing commercial threats.

Brazil

Candidacy for superstar status is now being assigned to Brazil which is in a strong resource position and more advanced politically and technologically than many of the other countries with a surplus of resources.

While not a major potential oil reservoir, Brazil is adjacent to major basins and has some offshore possibilities. Its main strength is in mineral resources. Brazil also has a strong agricultural potential; if climatological forecasts come true, world cooling will shift prime temperature zones toward the equator, increasing Brazil's arable acreage. The military government of Brazil lends a source of stability and reduces the vulnerability to terrorism against foreign operators.

The resource situation foreshadows interesting potential for new politico-economic bedfellows. Japan is looking at Brazil, not as a competitor, but a potentially powerful ally who has much to gain from Japan's technology and capital in exchange

*Kahn, Herman and B. Bruce-Briggs. *Things to Come*, The MacMillan Company, New York, New York, 1972.

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for a share of the profits. Latin America, however, is not blind to the success which the Arab states have had using the cartel approach to international trade and will be strongly motivated to overcome traditional incompatibilities if the ransom appears sufficient.

China

Another type of analysis* adds a different element to the forecast. A mathematical index of projected power based on population, steel production, and energy output forecasts indicates that China will surpass the U.S., the Soviet Union, and Western Europe by 1980 and will surpass these three power bases combined in the early 1990's. To make this projection more realistic, rather than the current 2.5% population growth rate for China, indexes have been computed for a 1.0% and 0.5% population growth which serves to delay the onset of China's projected achievement but does not change substantially the major conclusion. While the simplifying assumptions of this type of mathematical projection ignore many of the dynamics in the evolution of national power, the conclusion retains enough rationality that China must be predicted as a world power of increasing dominance during the 1980's.

Countercultures vs. Counterreformation

The emergence of a significant world-wide countercultural element is the root force which must be recognized in looking for what will be significant intelligence questions of the "eighties." There are identifiable countercultural forces of growing proportion which may impact on cultural or national ideologies in most major countries. While these forces may not have significant impact on international policy during the 1980's, they will continue to provide the motivation for revolutionary and terrorist activity of international consequence.

The problem of counterreformation and the return to traditional national values may be of greater consequence in the near to intermediate future. Whether future U.S. policy represents the new liberalism or a reactionary ideological renewal of its own, the counterreformation behavior of other governments will be a problem for U.S. foreign policy.

Castro's return to traditional values provided the mechanism for the introduction of Soviet communism into the Western Hemisphere. It provides the best demonstration of why the monitoring of cultural trends is a legitimate intelligence concern of increasing significance.

Terrorism

Terrorism is a highly effective political weapon. A few fanatics can terrorize many people. The costs to suppress terrorism often exceed its relative importance. National and international establishments are not always prepared to meet these costs. Terrorist activity is currently in its infancy and growing. Skyjacking, suicide attacks, and kidnapping are becoming daily events. Letter bombs have been demonstrated to be an effective weapons delivery system without theoretical range or accuracy limitation.

While the limits to sophistication have hardly been reached in terms of weapons involved—nuclear devices and chemical incapacitants appear now to be within the capability of underground operants—the vulnerability of highly complex industrial nations far exceeds their ability to defend themselves against such attack.

Transportation systems, electric power networks, mass computerized record systems, municipal water supplies, and energy supply systems would be highly sensitive to disruption by relatively unobtrusive terrorist tactics. Continually improving and expanding international transportation and communications add to the capability of international terror groups to attack vital national functions. There appears to be little hope of protecting these systems, especially in an open society. By the 1980's, intelligence operations against terrorist organizations could become a major national security responsibility.

*Heiss, Klaus P., Klaus Knorr, and Oskar Morgenstern. *Long-Term Projections of Political and Military Power*, Mathematica, Princeton, N.J., January 1973.

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TECHNOLOGICAL TRENDS

On a probabilistic basis, the chances for unpredicted technological events will continue to increase. The probability of simultaneous discovery increases and participation of newly industrialized societies will continue to increase.

Nuclear Proliferation

Kahn* provides the following scenario for nuclear proliferation:

> "1975-1985: Japan in the late seventies or early eighties, West Germany about five years later soon to be followed by Italy; other possibilities are India, Australia, and Sweden."

India is ahead of schedule having conducted an underground nuclear test in 1974. Perhaps five to ten more candidates could have this capability within a decade.

Alternatively, a "worst-case" scenario is possible by postulation of the adoption of a neoisolationist position by the U.S. In this case, countries under the U.S. umbrella would be stimulated to develop nuclear armament capability; for example, Israel (Egypt in response), similarly, India and Pakistan, and Argentina, Brazil, or Mexico.

Strategic Weapons

Some of the strategic offensive weapons options, available in the seventies, but probably unnecessary and too costly or prohibited by treaty, have been suggested by Kahn* as possibilities for the eighties. Strategic missiles on the ocean floor or very large nuclear weapons in orbit are two of such possibilities. Pure fusion weapons with greater opportunity for proliferation and chemical or biological weapons, controllable both geographically and as to degree of effect are prospects. Ballistic missile defenses using space-based interceptors or entirely new concepts for anti-SLBM warfare are definite possibilities. Very large nuclear powered aircraft are likely by the 1980's which open up such possibilities as airborne mobile missile launchers with practically unlimited endurance and highly efficient transport of commercial and military materials.

Control of Environment

Other kinds of R&D results have both military and non-military application, for example:

> "Control of the geophysical environment by various means could bring great benefit to mankind and also revolutionary weapons possibilities . . ."
>
> "Pharmacology could improve the ability of soldiers and others to maintain peak performance or lead to the effective 'weaponization' of mind-influencing drugs."
>
> "Advances in the behavioral sciences could lead to solutions of cross-cultural problems, and importantly affect political military relationships."
>
> "Developments in sensors, computers, controlled systems, power supplies, transmissions, etc., could lead to diverse types of automata capable of doing many tasks now performed only by humans." *

As important as these technological innovations can be for future weapons systems, their application to the economic problems discussed earlier could be of even greater consequence. Plowshare uses of nuclear devices to stimulate petroleum yield and in the construction of canals and harbors could be in common use by the 1980's, thereby considerably modifying both the time and cost estimates for resource exploitation and projections of the 1980's scenario based on today's civil engineering techniques.

Technological Crisis

The "technological crisis of 1985" has been described by von Neumann.** He suggests that the accumulation of technology will reach crisis proportions by 1980 as the realization of both the physical and moral threats of technology create increasing disillusionment. With the exponential growth of technology in a fixed total geographic space, failure of complex systems serving large populations will create major crises. The segment of society (upper-middle class) historically most enthusiastic about progress is beginning to question progress for its own sake. Communication systems—telephone, television, and computer—are becoming to be understood not only as means for increasing one's scope of influence but to a larger extent as a means of being influenced. The potential rejection of technological progress suggested by such attitudes could have a significant dampening effect on some of the high technology prospects which could operate in shaping the 1980's scenario.

*Kahn, Herman and B. Bruce-Briggs. *Things to Come*, The MacMillan Company, New York, New York, 1972.

**von Neumann, John. *Can We Survive Technology?* Fortune, June 1955.

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1980 "DESCRIPTORS"

The scenario for the 1980's is outlined below:

Socioeconomic

1. Periods of critical shortage of natural resources, including food, will occur during the 1980's.

2. Economic development of underdeveloped, resource-rich nations will be accelerated by technology innovations.

3. Economic forces will lead to new alliances based on resource technology amalgamation, new nations will assume positions of world importance, e.g., Brazil, and competition for resources will lead to international friction.

4. Multinational corporations will overcome present difficulties with resource-rich, developing countries and will become increasingly involved in international politics.

Sociopolitical

1. The status of China as a world force will increase dramatically.

2. Chronic confrontations based on ideological differences and divided national states will continue.

3. Counterreformation trends will subside in the early 1980's as productivity expands during a period of heightened world economic competition.

4. In response, new forms of terrorism aimed at disruption of major industrial systems will reemerge in the 1980's.

Technological and Politico-Military

1. There may be an international "technological crisis of 1985" involving major collapses of highly interdependent, high-technology systems and an accumulating disenchantment with progress "for the sake of progress."

2. Development with both military and non-military applications will include:

- global communication networks;
- control of the geophysical environment;
- pharmacological means for influencing human performance;
- behavioral science solutions to socioeconomic and political-military problems; and
- new capabilities for automata to replace human functions.

3. By the 1980's, the nuclear weapons community will be expanded [redacted] 25X6 25X6

4. Progress will be made in agreements to limit military forces but will be accompanied by the introduction of new concepts in weaponry.

5. The following military technology possibilities may become realities in the 1980's: strategic missiles on the ocean floor, large nuclear weapons in orbit, pure fusion weapons, deployment of advanced weapons, new concepts in ballistic missile defense including space-based interceptors, advanced ASW concepts, and large nuclear powered aircraft.

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THE INTELLIGENCE COMMUNITY OF THE 1980's

The primary purpose of this projection into the future is to provide some basis for thinking about what capabilities the Intelligence Community will require to cope with possible threats to the security of the U.S. in the 1980's time frame.

In terms of resources available to the intelligence function, near-term projections are for a fixed budget at approximately today's dollar figure. This represents a net annual decrease in available resources approximately equal to the amount of inflation. It is probably overpessimistic to project this trend into the 1980's since allocation of national resources involve many complex and often transient conditions which cannot be appreciated in any sufficiently precise way. Nevertheless, it seems reasonable to assume that the tasks facing the Intelligence Community will provide a real test for the efficient utilization of resources.

Before the 1980's arrive, the Intelligence Community must solve the problem of intellectual compartmentation. Intelligence on natural resources may well be more acute to crisis prediction than military intelligence. Starvation in the 1980's is considered much more likely than nuclear warfare. But one thing which emerges above all others is that neither can be considered independently. With the growing awareness of the highly interdependent nature of factors which influence international events, the demand for collection, processing, and analysis of data must increase.

In order to cope with the production demands, the Intelligence Community of the 1980's must:

- Have adopted better methods to communicate predictions of hostile economic, political, or military actions to policymakers and to incorporate subsequent diplomatic feedback into on-going analyses.
- Have developed models of global phenomena which have a demonstrated level of validity and are exercised on a routine basis in the intelligence analysis and production functions.
- Have an integrated data system which can be maintained current with a practical level of analyst involvement and a retrieval and computational capability to support a wide range of analytic requirements. The systems will incorporate models of the subject area of concern as well as decision rules that cause certain actions to be taken automatically on the basis of newly received intelligence. The analyst will be able to use computer-network techniques to call forth data stored in differing formats on different computers (that may be widely dispersed geographically) and will be able to compose and distribute reports utilizing text-editing and other tools available in the 1980's. The system must be compatible with collection tasking for maximum support to the analytic functions.
- Have a diversified and flexible collection capability, equally effective in support of economic, political, and military requirements. Both technical and human collection systems must have the capability of assigning priorities and responding to mixed requirements in support of multivariate analyses.

Intelligence collection will become more difficult. Access to economic statistics will diminish. Their accuracy and credibility will be more suspected. Data on reserves, production and transportation of scarce commodities will be suppressed or masked. New technologies for industry and the development of revolutionary weapons for war will be more closely guarded.

Intelligence operations will be increasingly expensive. Access to technical collection sites will be denied. Opportunities for cover will vanish. Counter-intelligence capabilities in resource, technology, and capital rich countries will mushroom. Covert action opportunities will be denied by policymakers.

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THREATS FOR THE 1980's

The scenario for the 1980's has illuminated trends developing in the world that are contrary to our current foreign policy goals and overseas commercial activities. The trends appear to be influenced by increasing competition for scarce resources, pressures for basic social changes and innovations in weapons, and industrial technology. These trends portend a need for modification of the traditional roles, functions, and structures of the Intelligence Community.

The hypothetical threats for the 1980's and the conjectured intelligence questions are presented in the following pages. They are divided into three sections: socioeconomic, sociopolitical, and technological. Each section contains a description and a set of important intelligence questions which might be generated by each threat. The questions are intended to provoke thinking that may provide some inspiration to escape the bounds of tradition.

SOCIOECONOMIC THREATS AND QUESTIONS

Global Food Shortages

Long-term weather conditions are expected to induce global food shortages and great famines may result from dry weather patterns extending through Africa, the Middle East, India, and South Asia.

Mean temperatures will decline for the next 50 years. The cooling trend portends reduced crop yields in Canada, Northern Europe, Siberia, and Northern China.

These trends will result in increased emergency demands for food supplies. In the absence of food, mass human migrations from submarginal to marginal land may result.

Crop failures in Central Asia and the deserts may spark invasions of coastal China. Conflicts may breakout among herders and coastal plains farmers of West and South Africa.

Intelligence must prepare to detect such trends and predict food shortages and inflation of food prices. It must identify countries that cannot or will not pay and may fight given some expectation of survival.

Questions

1. What fundamental and significant climatological trends are apt to make themselves felt during the 1980's?
2. What would be the likely consequences in terms of famines, populations, economies, and habitable land areas?
3. How can effective birth control be instituted in undeveloped countries to mitigate the food shortage problem?
4. What international pressures will be exerted on the United States and Canada as principal food suppliers to share their abundance of food with the rest of the world by appreciably curtailing their own consumption?
5. What countries will have drought and famine? What migrations, invasions, and conflicts will result?
6. What impact will national weather modification efforts have on neighboring nations?

Inflation, Foreign Trade, and National Power

The past two decades have been periods of increasing inflation. Recently, the inflation rate has accelerated. Prices of vital resources are rapidly escalating. Increasing prices have caused storage of commodities as a speculation, anticipating higher future prices. This is generally true of resources that require the least space for storage, for instance, gold. Some resources, such as oil, can best be stored by keeping them in the ground.

During periods of radical monetary inflation, prices of raw materials advance more rapidly and extensively than prices of semi-finished and especially, finished products. For example, countries that have to buy all their petroleum will quickly use up their working capital. Unless they have sufficient reserves of capital to weather the inflation storm, they will run into severe economic depression.

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One of the main characteristics of the period preceding the outbreak of World War II was the extensive use of international economic relations as an instrument of national power politics, together with a "war of nerves." This followed a period of world inflation in the 1920's, the crisis in the world's monetary system, and a subsequent period of commercial and industrial depression in the 1930's.

Questions

1. Will current inflation, exploding world monetary crisis resulting from the Arab oil embargo, and the "war of nerves" involving Israel and the Arabs, the U.S. and West Europe, China and the U.S.S.R., result in competition for resources and critical shortages?
2. What will be the structure of foreign trade during the next decade?
3. Will there be some inherent weaknesses in foreign trade that will make it vulnerable to the will of governments that might use it in the pursuit of power?
4. Will new alliances form to ensure basic economic survival or to wage economic warfare?
5. What role must intelligence play in anticipating and dealing with severe commercial and industrial depression?

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*Worsening Energy Crisis**

Government control of key industries through the necessity of rationing energy	By the end of the 1970's
Government spending of hundreds of billions of dollars in crash programs for energy procurement	By the end of the 1970's
Strip-mining for coal on a vast scale in the U.S.; deep coal mining on a vast scale in most countries	1980
A "Great Depression" of 1929 scope: reduced building construction; reduced employment opportunities; a stock market collapse	By the 1980's if even one-half of the anticipated energy shortage materializes
Loss of world leadership to Russia due to a crippling energy shortage	By the 1980's
A world conflict over energy resources and possible military conflict	By the 1980's

*Lawrence Rocks and Richard P. Runyon, Crown Publishers, New York, 1972, excerpt from their scenario as reported in the Futurist, February 1974, page 26.

Questions

1. What international information must be available to government policymakers and industrial management when making decisions about the tremendous investments needed to ensure adequate energy resources for the future?
2. Will Soviet oil exports be used as a lever in the implementation of political and economic relations with other nations?
3. What impact should a Soviet breakthrough in fusion energy have on relations with energy-starved countries such as Japan, Italy, et al?
4. What are the probable causes of potential military crises in the Persian Gulf? What combinations of countries are likely to be involved? What are the causal interrelationships and the consequences of corrective actions?

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Multinational Corporations

Multinational corporations (MNC's) dominate the natural resource markets of the world. They control most of the production and distribution from the resource reserves of the free world. They maintain the primary means for natural resource exploration, development, and production. They have legal, economic, and political relationships with both industrial countries and developing countries which form part of their unique brokerage system for the negotiation of global purchase and sale of resources.

The MNC's are in trouble. Members of governments in developed countries accuse them of duplicity in regard to their statistics, particularly those related to prices, costs, and reserves. The underdeveloped nations, who must export resources, rely on these companies with suspicion and hard feelings. Their relations are strained to the point where the concessions are being expropriated.

One crucial threat to the corporations are the periodic economic depressions that have racked capitalism over the past hundred years and nearly caused its ruin in the 1930's. The spectre of an impending economic disaster has been raised by the massive trade deficits for the U.S., Japan, and West European countries as a result of exploding oil prices.

Questions

1. What is the future role of the MNC's in stabilizing the resource supplies of the world versus the conflicts their policies may generate among the governments of developed and developing nations?
2. As some host governments take control of operations, will they have the practical knowledge of the industry needed to avoid critical resource shortages in the world markets?

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4. Will a method be developed by which MNC's could be incorporated under international laws, subject to a single international income tax or will they seek greater support and protection from home governments?

SOCIOPOLITICAL THREATS AND QUESTIONS

Social Change and Prediction of Conflicts

The complex social systems evolving in advanced industrial societies are generating internal contradictions or adversary cultures which have anti-bourgeois values and countercultures which advocate antinomian revolutions in life style. These cultures may spawn social and national antagonisms between various classes and races. The current international terrorist activities in the Middle East may portend such developments. The ominous theme sounded in 1956 by Lin Piao when he warned that the class struggles of the end of the twentieth century could be between nations rather than within them may be relevant to the emerging struggle between the underdeveloped nations who possess vital natural resources and the industrial nations who need them.

A principal problem for intelligence is to predict hostile economic, political, or military actions. Such predictions are inherently difficult. No formalized rules have been developed or adopted by the Intelligence Community.

Predictions in the community are made by individual analysts. Their success is largely dependent on their detailed knowledge of foreign government leaders and judgment based on long study of the countries concerned. Their task is to produce a report that provides assessments and predictions that are useful to decisionmakers. The record of the community's predictions of important international events suggests that the methods used are inadequate.

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Questions

1. What are the significant determinants of social, political, and economic change?
2. What are the likely antitheses to current societal arrangements?
3. What new stresses could emerge from an "irreversible peace" in the 1980's?
4. Will non-nuclear countries have the freedom to be irresponsible?
5. What are the plausible trends in the development and distribution of cheap weapons to terrorists?
6. What methods can be used to assimilate all the information that the community collects in order to advise decisionmakers of the important trends and prospects?

Control of the Sea Beds

Some of the greatest sources of wealth lie in the ocean floor. The development of technology for exploitation of its mineral and biological resources is accelerating. Increasing demands will be placed on the ocean as a source of food—fish, crabs, and other organisms. Development of offshore oil and gas reserves will accelerate. Nodule deposits of high-grade manganese ore are being discovered. Aluminum, copper, cobalt, titanium, and other metals are also contained in nodules. Initial exploitation of minerals on a commercial scale is projected for the mid-1980's.

A technological revolution is opening up the ocean beds. Exploitation of its mineral and biological resources is accelerating. The oceans will be subjected to ever increasing exclusive and competing national controls. Rival states or groups of states will divide widening portions of the ocean bed.

Questions

1. Which nations will possess the technology, capital, political, and military protection required to exploit ocean-bed resources?
2. How will the benefits from the ocean, the last great resource of the earth, be maintained and divided?
3. What role will Soviet naval and fishing fleets play in the race for control of the ocean resources?
4. What military and economic controls will be essential to constructive, international cooperation and the prevention of disastrous conflicts?
5. What capabilities for underwater monitoring and search will be required to control and regulate international agreements concerning the sea beds?

Global Communications

Global service networks for television, telephone, air transport control, weather, facsimile, and other data transmissions are creating new social interactions and economic interdependencies. The increasing dependence of individual nations, national alliances, and international consortiums on these networks will make them more susceptible to threatened interruption or exploitation by destructive or obstructive action.

The broader and longer range implications of the rapid development of satellite systems for more direct human communications are not yet generally recognized. Governments, business organizations, or individuals can communicate with anyone, anytime, at any place in the world.

This capability is revolutionizing the development pattern of emerging nations. It places the application of human knowledge within the reach of every nation and community.

Satellites capable of relaying telecasts direct to home TV sets will be in common use during the 1980's. European, Japanese, and the Indian governments have plans to make use of such systems.

Pressures to curb these trends are developing, particularly where the telecasts may intrude on neighboring countries with different political systems. Communists and some developing countries are leading the opposition.

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*Biological and Behavioral Innovations for the 1980's**

	Year Event to Occur	
	Experts	Consensus
Drugs to improve perception	1985	1975 – 2010
Preselection of the sex of babies with 90% certainty	1980	1980 – 1990
Drugs to improve perception	1985	1975 – 2010
Human clone	1985	1990 – 2010

These projected developments reveal the recent trends of the strong focus of interest in bioengineering. These and related developments are expected to provide more precise and accurate understanding, prediction, and control of individual and group behavior. Developments are anticipated in remote reading and prediction of physical and mental health and in the understanding and control over neurophysiological and brain functions. Significant improvements in human intellectual and physical performance may emerge.

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TECHNOLOGICAL THREATS AND QUESTIONS

Advancement of Soviet Technology

The Soviet leadership places more emphasis on science and technology than any other subject regarding future plans and goals for the U.S.S.R. Most of the top leaders are engineers by training. Nine of the sixteen voting members of the Politburo are graduates of technical schools. Seven of the ten CPSU Secretaries and eight of the nine Deputy Premiers also are technical school graduates.

These technology oriented leaders view attainment of preeminence in science and technology as essential to the ultimate triumph of socialism on a world scale. Party General Secretary Brezhnev (1935 graduate of the Dneprodzerzhinsk Metallurgical Institute) asserted, "the center of gravity in competition between the two systems is now found precisely in this field."

The leadership in the United States has seriously questioned the value of pursuing the further development of science and technology. The number of scientists and engineers engaged in R&D in both the U.S. and U.S.S.R. were about 500,000 in 1966. Since then, the number continued to grow to about 800,000 in the U.S.S.R. and declined to about 400,000 in the U.S. The Office of Science and Technology within the Executive Office of the President was eliminated and its functions transferred to the Director of the National Science Foundation. Congressman John W. Davis of Georgia pointed out that the present standing of the Director ". . . as a civil servant is of the same grade as an Assistant Secretary of Agriculture."* These attitudes suggest the possibility of a future technology gap that favors the U.S.S.R.

Questions

1. What are the prospects for future gaps in technologies that favor the U.S.S.R. or other industrial nations over the U.S.?
2. What are the prospects for development of better theories for the impact of scientific discovery and invention as they relate to key advanced and developing nations?
3. How can comparisons be made at the level of industrial technology, the level of engineering development, and the future level of technology?
4. What new weapons concepts could emerge which could not be detected or recognized with contemporary monitoring techniques?

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*Hearings before the Committee on Science and Astronautics, U.S. House of Representatives, 93rd Congress, 1st Session, July 17, 19, 22, 23, 1973, No. 8, p. 72.

*Robert H. Kingston. *Laser Technology; Technology Forecast for 1980*, edited by Ernst Weber, et al., Van Nostrand Reinhold, Co., 1971.

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3. What countries

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are likely to produce nuclear weapons? How can these activities be monitored?

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Questions

1. What ASW capabilities can be expected of the U.S.S.R. in the 1980's?
2. What countermeasures can be anticipated against U.S. SLBM's?
3. What are the prospects for revolutionary invention in surface or subsurface naval warfare?

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*C. S. Draper, Instrumentation Technology, p. 183, in Technology Forecast for 1980, edited by Ernst Weber, et al., Van Nostrand Reinhold, Co., 1971.

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SOME POSSIBLE SURPRISES

Exploding Internationalism

Possible surprises for the 1980's may occur through an evolution of intimate international political and economic relations made increasingly possible by the exponential growth of modern technology and its effects on the growth of contemporary societies.

During the 1980's, increasing forces will create an environment conducive to international government. These forces include:

- Weapons' costs, treaty monitoring, subnational threats (terrorism), doomsday weapons, proliferation of nuclear capabilities, and possibly accidental or unauthorized use of nuclear weapons will become increasingly persuasive arguments against traditional forms of managing international problems.
- Accelerating competition for food and diminishing natural resources will increase pressure for international management and control to avoid conflict and inflation.
- Growth of multinational corporations will create the need for international agreements to cope with the unilateral political and economic influence available to these mammoth organizations.
- Control of population growth, increased literacy, world-wide communication, and mass high-speed transportation will expand the international exchange of ideas and culture.
- Increasing use of world conferences and centers to investigate problems of common concern, discuss ideas, develop solutions, and transact business.
- Growth and amalgamation of countercultural forces disenchanted with traditional national goals will exert strong political pressure against national competition.
- Common quest for a more abundant and creatively meaningful life.
- Trends toward movement across international boundaries free of formalized restrictions such as passports, visas, etc.
- Growing acceptance of English as a universal language.

Emergence of an International Technocracy

Scientists and engineers will play a major role in the epochal transformation of the world by active and forceful participation in national and international politics. They will provide the fountainhead of international political efforts to build agriculture, housing, education, commerce, and industry in emerging industrial countries. These countries will adopt space age technologies, not the nineteenth century industrial technology which still burdens the major cities of North America and Western Europe. The future of these emerging countries will be profoundly influenced by certain fields of science and engineering that are undergoing rapid change. New ideas will have their greatest impact on future societies now emerging from the embryo stage into the take-off stages. The forces that will drive epochal technological changes include:

- Demise of the anti-technology mania of the 1970's; the collapse of psychological and ideological resistance to radical changes initiated by new technological developments as post-industrial governments perceive an incipient technological gap in their military and industrial capability.
- Increasingly forceful participation by some of the best scientists and engineers in the international political processes as great technological changes of the 1980's make them vitally important and places the world increasingly in need of using technical minds for technical decisions.
- The systematic evolution of a new social force based on technical organization and industrial management; a social force reminiscent of the "Soviet of Technicians" described nearly half a century ago by Thorstein Veblen in his "Engineers and the Price System."
- The application of technical resources to the solution of the large scale, crucial problems of society; new ideas that will revolutionize socioeconomic trends and impart great powers of expansion in industry and commerce among the developing countries of the world.
- The explosion of science into undeveloped countries, such as China and India, launching them on the trajectory of the logistic growth

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curve. Many of the emerging countries will spectacularly improve their position in world science and consequently the majority position of the big nations in world science will sharply diminish.

- The development of cheap methods of producing fresh water from the sea and the installation of desalting plants on many parched sea coasts of the world.

- The development of cheap methods to produce the important ammonia fertilizer necessary to help feed the hungry people of the world.

- The integration of lasers, computers, television, rockets, and satellites into instantaneous world-wide communication systems.

- The development of new materials that will initiate profound changes in industrial engineering and drastically alter patterns of world trade.

- Systematic computerized simulation and analyses of multidimensional sociopolitical, socioeconomic, and technological problems of large metropolitan areas.

- The design of sweeping bands of metropolitan areas stretched out over the surfaces of the continents—the ecumenical metropoles of the future.

- Man-machine symbioses by brain amplification and brain to computer interconnections.

- Interplanetary rocket flight—the cosmology of the universe, its past and future; exploration of the last worldly frontier—pioneering development of the natural resources beneath the oceans.

- Improved understanding of basic laws of physics, field theory, and submolecular physics.

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